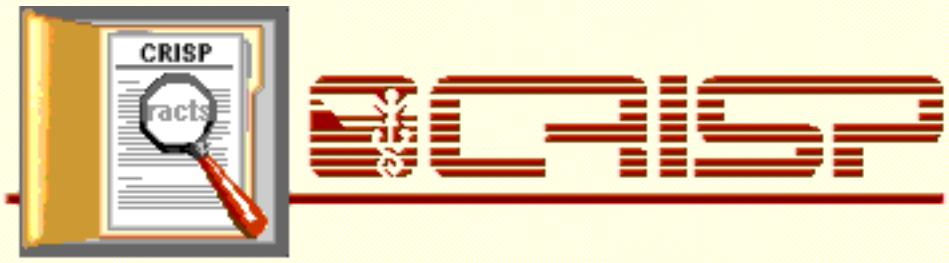
Version 2.0



Abstract

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Grant Number: 5R01NR004339-03
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Project Title: PREDICTING DELAYED CEREBRAL ISCHEMIA IN SAH

Abstract: *Subarachnoid hemorrhage (SAH) is a clinical emergency occurring to healthy individuals that involves a sudden rupture of a cerebral vessel and hemorrhage into the space between the brain arachnoidea. If the person survives the initial SAH injury, 50 to 60% will develop symptoms of impending delayed cerebral ischemia (DCI), 5-10 days following the initial injury. There is evidence suggesting that decreased cerebral oxygenation or brain activity from DCI may be detected by multimodal neurophysiologic (NP) monitoring, however, no systematic study has been undertaken to compare the sensitivity and specificity of NP monitoring against the traditional standard of care periodic clinical nursing neurologic assessment. The purpose of this study is to examine the efficacy of bedside multimodal NP monitoring compared to a routine neurologic examination in the detection of the clinical emergency, DCI, in patients with severe SAH. The specific aims of this project are to: 1) examine the detection of DCI after SAH using either multimodal NP monitoring (blood flow velocity, 2 indices of cerebral oxygenation and a single index of brain electrical activity) in combination with the clinical neurologic examination and 2) determine whether multimodal NP monitoring detects DCI earlier when compared to the current standard of care, the clinical neurologic examination. Using a within subject repeated measure design, data will be collected on blood flow velocity, two indices of cerebral oxygenation using near-infrared technology and electroencephalography bispectral index as well as the clinical neurologic examination from days 5 through 10 inclusive following a severe SAH in 80 patients at risk for DCI.. Global cerebral blood flow studies using 133 Xe at the bedside will be conducted daily to examine trends in flow; the presence of DCI will be verified by regional low flow as detected using xenon-enhanced computed tomography CBF . Sensitivity and specificity*

will be estimated and compared between the neurologic examination and the individual methods of NP monitoring A one way within subjected repeated measures analysis of variance will be used to compare the time of detection by types of monitoring in patients with verified DCI.

Thesaurus Terms:
cerebral ischemia /hypoxia, cerebrovascular disorder diagnosis, diagnosis design /evaluation, meninges hemorrhage, neurophysiology, patient monitoring device, subarachnoid space
blood flow measurement, brain circulation, brain electrical activity, cerebral circulation, oximetry
clinical research, computed axial tomography, electroencephalography, human subject

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